

LEVEL 2 OVERHAUL CHECKLIST (for disc-brake bike)

*Not all steps apply to all bikes. Italicized items unavailable at lower job levels.
Torques are minimum recommended in absence of manufacturer specifications.*

Check-off items done to specification. Mark items with “NA” when not applicable, or “X” when problems could not be repaired and/or are in need of further attention.

EXISTING CONDITIONS

- Derailleurs operated and performance evaluated.
- Brakes operated and performance evaluated.
- Stem height *and handlebar position* marked or recorded.
- Handlebar add-on or extension positions* recorded.
- Control-lever positions recorded.
- Seat height, *fore/aft position, and angle* recorded.

DISASSEMBLY, CLEANING, AND INSPECTION

- Wheels removed.
- Tires inspected for damage and wear, then removed.
- Rear cogs or freewheel removed.
- Freewheel or cassette cleaned in solvent.
- Freewheel or cassette inspected for wear and damage.
- Hubs disassembled (cleaned, including freehub body).
- Hubs and axles sets inspected for wear and damage.
- Rims and spokes thoroughly cleaned.
- Rims inspected for damage.
- Pedals removed, *disassembled, and cleaned*.
- Pedals inspected for worn and damaged parts.
- Crank arms removed, cleaned and inspected.
- Chainrings removed, cleaned, and inspected for wear.
- Bottom bracket removed.
- Bottom-bracket cartridge bearings inspected.
- Chain removed and cleaned.
- Chain inspected for wear and damage.
- Mechanical disc brakes:** Brake cables removed, inspected for rust, frays, and wire and housing kinks.
- Hydraulic disc brakes:** Hoses and hose fittings inspected for damage and leaks.
- Rotors inspected for damage, true, and security.
- Rotors and calipers cleaned w/ isopropyl alcohol.
- Brake levers inspected for damage and leaks.
- Brake caliper inspected for damage and leaks.
- Brake pads removed and checked for wear and degradation (crumbling, scoring, burning).
- Derailleur cables removed and inspected for rust, frays, and kinks in the inner wires and housing.
- Rear derailleur removed, disassembled and cleaned.
- Rear derailleur inspected for damage and worn pulleys.
- Front derailleur removed, cleaned, and inspected.
- Stem removed from fork.
- Stem and *handlebar-binder* bolts removed and cleaned.
- Handlebar extensions or add-ons removed and inspected, and bolts removed and cleaned.*
- Handlebars and stem inspected for damage.
- Headset disassembled and cleaned.
- Headset parts inspected for wear, damage, and looseness in frame and on fork.
- Fork inspected for damage.
- Seat post removed and cleaned.
- Seat binder removed, cleaned, and inspected.*
- Frame thoroughly cleaned.
- Frame checked for damage and cracks.

FRAME PREP, ASSEMBLY, and BEARING ADJUSTMENT

- Stem *and handlebar binder* bolts greased and installed.
- Handlebar extension/add-on bolts greased and installed.*

- Brake-caliper threads, pivots, and springs lubricated and *calipers* assembled.
- Adjustable brake pivots adjusted for no play or binding.
- Brake-pivot nuts and/or bolts checked for security.
- Rear derailleur threads, pivots, and springs lubricated and pivots assembled.
- Rear-derailleur pulley wheels lubricated and installed.
- Seat tube honed if necessary.
- Seat binder lubricated and installed.*
- Seat post and seat tube greased.
- Seat post installed to original depth or minimum-insertion point, whichever is lower.
- Seat-post retention mechanism secured.
- Seat checked for proper alignment and security (non-integral clamp 130in-lbs, single-bolt-integral clamp 120in-lbs, double-bolt-integral clamp 85in-lbs).
- Fork alignment checked and fixed (as materials allow).*
- Fork dropouts aligned (as materials allow).
- Frame rear triangle aligned for proper width and center (as materials allow).*
- Rear swing-arm/linkage pivots secured.
- Rear dropouts aligned (as materials allow).
- Frame and fork polished or waxed.*
- Hubs assembled with worn parts replaced (where possible), fresh grease, and new bearings (parts addtl.).
- Rims trued laterally to .5mm tolerance or better.
- Rims trued radially to .5mm tolerance or better.
- Wheel dish corrected to .5mm tolerance or better.
- Spokes tensioned to 90-120 kgf right-side average (rim and spoke condition allowing).
- Spoke tensions set to $\pm 10\text{kgf}$ of average for each side.*
- Wheels stressed until true is stabilized.
- Hubs adjusted to have no free play secured in bike, but with free play when QR is loosened 45°.
- All hub locknuts secured to 120in-lbs.
- Freewheel or cassette lubricated and installed (cassette locking secured to 355in-lbs).
- Tires installed, inflated, and inspected for proper seating.
- Bottom-bracket fixed cup (or cartridge) installed with Loctite 242 and secured to 300in-lbs.
- Bottom-bracket threads treated with Loctite 242 and assembly installed.
- Chainrings installed to right crank arm.
- Chainring bolts secured to 50in-lbs.
- Crank-arm bolts greased and arms secured:
 - Square taper – 335in-lbs (Race Face 420 in-lbs)
 - Spline fit (Octalink & ISIS) – 420in-lbs
 - Split-hole (such as Hollowtech II) binder bolts – 110in-lbs
- Threaded dustcaps lubed and gently secured.
- OR** One-key-release washers greased, cap threads prepped with Loctite 242, and caps gently secured.
- Pedals re-assembled with damaged parts replaced, fresh grease, and new ball bearings (parts addtl.).*
- Pedal bearings adjusted to minimal drag and no free play.
- Pedal threads greased and pedals secured to 300in-lbs.
- Headset assembled with loose parts secured, worn parts replaced, fresh grease and new bearings (parts addtl.).
- Stem bolts greased and installed, stem and top cap installed, and stem aligned perpendicular to fork.
- Headset adjusted to loosest setting with no free play.

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- [] Stem-binder bolts secured to 50in-lbs (double bolts) or 120in-lbs (single bolt).
 - [] Handlebars inspected for damage *and installed to original (unless unacceptable) alignment.*
 - [] Handlebar-binder bolts *greased, installed,* then secured (8mm bolts: 180in-lbs, 7mm bolts: 155in-lbs, 6mm bolts 120in-lbs, side-by-side binder bolts: 60in-lbs each).
 - [] Handlebar add-ons *installed, aligned* and secured.
 - [] Existing pads replaced if remaining wear life is less than 25%
OR remaining life is ____%, so old pads reinstalled.
 - [] Brake levers set to proper alignment (unless already acceptable), then secured
6mm-diameter clamp bolts: 35in-lbs
5mm-diameter clamp bolts: 20in-lbs
4mm-diameter clamp bolts 15in-lbs).
 - [] Brake-lever pivots and cable adjusters lubricated.
 - [] **Mechanical disc brakes:** New or existing brake housings sized.
Lever to frame piece: as short as possible to allow full normal fork rotation
All others: as short as possible without abrupt bends at ends, or hyperextension at limits of suspension travel).
 - [] **Mechanical disc brakes:** Brake-housing ends finished with filing and end caps (wherever end caps will fit).
 - [] Rotors trued as needed.
 - [] Wheels mounted in proper alignment and security (front axle nuts 180in-lbs, rear axle nuts 240in-lbs.
OR Q.R. skewers set so force is required through out the last 90° of closure and base of lever ends up parallel to dropout.
 - [] **Mechanical disc brakes:** Cable lubricated and installed, and pad clearance set to minimum without rub that could be audible while riding (rub that can only be heard in non-riding conditions is may be unavoidable).
Hydraulic disc brakes: Brakes operated to initiate pad-clearance self adjustment.
 - [] **Mechanical disc brakes:** Cable pinch bolt secured to minimum 70in-lbs, or to manufacturer's recommendation if higher.
 - [] Derailleur hanger aligned to less than 4mm tool-to-rim gap at all points.
 - [] Rear derailleur installed and secured to 70in-lbs.
 - [] Front-derailleur pivots lubricated.
 - [] Front derailleur set so bottom of outer cage plate clears outer chainring teeth by 1-3mm.
 - [] Front derailleur rotated so outer cage plate is parallel to line of chain in outermost gear combination.
 - [] Front derailleur secured to 35in-lbs.
- BRAKE AND DERAILLEUR ADJUSTMENTS**
- [] Under-torqued bracket bolts (if any) and under-torqued caliper bolts removed and treated with Loctite 242.
 - [] Adapter-bracket bolts (if any) secured to minimum 70in-lbs, or to manufacturer's recommendation if higher.
 - [] Caliper aligned to center rotor between pads and to align pad faces as parallel as alignment system permits (not all systems allow alignment in all axis). **NOTE:** In some cases, milling of frame/fork mounting surfaces may be required, resulting in a surcharge).
 - [] Caliper bolts secured to minimum 70in-lbs, or to manufacturer's recommendation if higher.
 - [] **Brakes with manufacturer-original safety wire or safety clips on bracket and caliper bolts:** Wire or clips inspected for proper installation and corrected if faulty.
 - [] New or existing derailleur housings sized and ends finished with end cap. (From controls to frame: sized as short as possible to allow full normal fork rotation. To rear derailleur: sized such that with derailleur body parallel to chain stay, housing enters adjusting barrel in a straight line.)
 - [] New or existing derailleur cables lubricated where they pass through housings.
 - [] Derailleur cables routed so they do not interfere with any other cables, and pinch mechanisms secured to 35in-lbs.
 - [] Derailleur cables pre-stressed.
 - [] Wobbling chainwheels aligned to less than .5mm wobble.
 - [] Chain lubricated, sized to longest acceptable length in small/small gear combination, and installed.
 - [] Chain inspected for tight links, protruding rivets, and too-short symptoms in big/big gear combination.
 - [] Rear-derailleur limit screws set to tightest settings that allow shift to largest and smallest sprockets (with no excess noise).
 - [] Rear-derailleur cable tension set to tightest setting that allows indexing without out-shift hesitation or post-shift chain-to-cog rubs.
 - [] Front-derailleur outer-limit screw set to hold .5-1.0mm clearance between the chain and outer cage (with chain on outer/outer gear combination).
 - [] Front-derailleur outer-limit screw set to hold .5-4.0mm clearance between the chain and inner cage (with chain on inner/inner gear combination).
 - [] Front-derailleur overshift checked in all gear combinations.
 - [] Front-derailleur cable tension set to create .0-.5mm clearance between inner cage and chain (chain on innermost rear cog and next-to-outermost chainring), with no audible rubs in any gear combination.
 - [] Accessories checked for mounting security and interference with moving parts or safety hazards.
- TEST RIDE AND INSPECTIONS**
- [] Handlebar and add-ons load-tested (30lb side load and 150lbs down load - tested at furthest point from headset).
 - [] Seat nose load tested (50lbs side load and 75lbs down load).
 - [] Brakes checked for stopping power and squeal.
 - [] Bicycle checked for tracking problems.
 - [] Derailleurs checked for performance and overshift.
 - [] Chain and freewheel cogs checked for skipping under load.
 - [] Bicycle checked for unusual noises.
- MECHANIC'S SIGNATURE _____
- DATE _____